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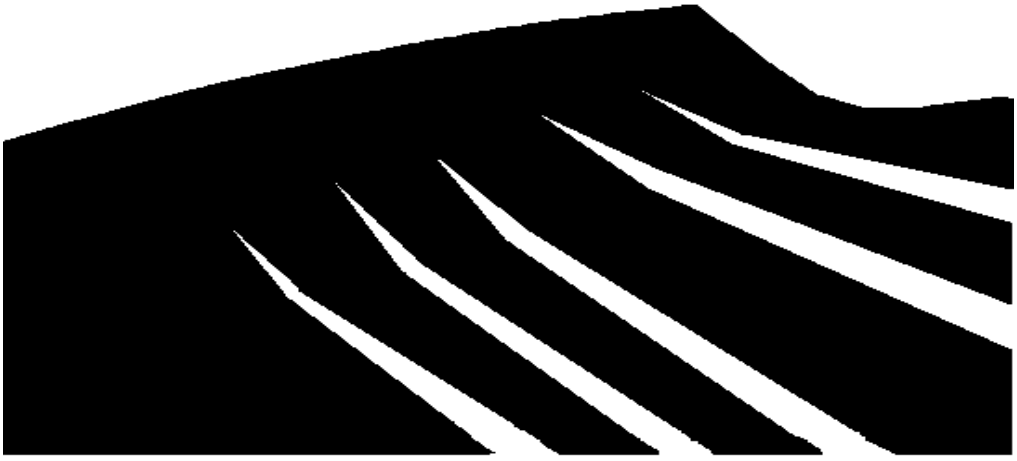
DATA COLLECTION SYSTEM FIELD INSTRUMENT WIRE TERMINATIONS

LOS ALAMOS

QUALITY PROGRAM



APPROVAL FOR RELEASE

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Los Alamos
Yucca Mountain Site Characterization Project

HISTORY OF REVISION

REVISION NO.	EFFECTIVE DATE	PAGES REVISED	REASON FOR CHANGE
R0	06/16/97	N/A	Initial procedure.

DATA COLLECTION SYSTEM FIELD INSTRUMENT WIRE TERMINATIONS

1.0 PURPOSE

This Detailed Technical Procedure (DP) describes the operational process for terminating instrument wires to the Data Collection System (DCS) on the Yucca Mountain Site Characterization Project. This process will establish a baseline reading prior to terminating field instruments to data collection hardware (system) and will ensure instruments are correctly wired to the system. This DP may also be used to take baseline readings from instruments that will not be immediately terminated to the DCS. Following this process will provide DCS management with a process to document and accept instrument termination to the system.

2.0 SCOPE

This procedure applies to personnel qualified within the Los Alamos quality assurance program who conduct DCS activities in the Exploratory Studies Facility. While this procedure is originally intended for use with Hewlett Packard digital multi-meter units, it may be applied to other models.

3.0 REFERENCES

LANL-YMP-QP-12.3, Control of Measuring and Test Equipment and Standards
AP-17.1Q, Record Source Responsibilities for Inclusionary Records
FWP-ESF-96-001, Exploratory Studies Facility Data Collection System

4.0 DEFINITIONS

4.1 Accuracy Calculation - Documentation that describes the combined system accuracy measured with the system and the process calibrator.

4.2 Instrument Index. The documentation that describes the instrument parameters and acceptance criteria applied to the instrument software configuration.

4.3 Loop Index. The documentation that describes the hardware connection from the field instrument to the DCS measurement devise within the system.

4.4 System interface. The system terminal block number (TB#) and terminal block channel number (TB CH#) described in the Loop Index.

5.0 RESPONSIBILITIES

The following personnel are responsible for the activities identified in Section 6.0 of this procedure:

- Data Manager
- DCS Engineering Support

- DCS Staff
- DCS Technical Support

6.0 PROCEDURE

The use of this procedure must be controlled as follows:

- If this procedure cannot be implemented as written, YMP personnel should notify appropriate supervision. If it is determined that a portion of the work cannot be accomplished as described in this DP, or would result in an undesirable situation, that portion of the work will be stopped and not resumed until this procedure is modified, replaced by a new document, or current work practice is documented in accordance with QP-03.5, subsection 6.1.6.

- Employees may use copies of this procedure printed from the controlled document electronic file; however, employees are responsible for assuring that the correct revision of this procedure is used.

- When this procedure becomes obsolete or superseded, it must be destroyed or marked "superseded" to ensure that this document is not used to perform work.

6.1 Principle

This DP provides the methods to connect PI's or other personnel's field instruments to the DCS hardware that will automatically take periodic measurements from the instruments. Wire termination generally includes the taking of baseline reading from instruments prior to connecting them to the system. Implementation of this DP will provide assurances that the signal pathway from the instrument through the system output is functioning properly. It is the responsibility of individuals using this data collected by the DCS to perform any data reduction or development. Overall DCS activities are described in Field Work Package FWP-ESF-96-001.

6.2 Equipment

The following equipment is used, but is not limited to, in the implementation of this procedure:

- data collection hardware (system)
- field instruments (instruments)
- process calibrator
- hand tools (screwdriver, wire cutters, etc.)

6.2.1 Equipment Malfunctions

Due to calibration and configuration, any errors will be apparent. Malfunctions will be documented, reported to the Data Manager, and addressed.

6.2.2 Safety Considerations

Before working in construction areas, personnel will survey the work area to identify potential hazards such as moving equipment, electrical hazards, and tripping/falling hazards. Underground operations shall be conducted within the general underground training (GUT) guidelines under the constructor's supervision and safety responsibilities.

6.2.3 Special Handling

N/A

6.3 Preparatory Verification

N/A

6.3.1 Hold Points

N/A

6.3.2 Calibration

The process calibrator, and system will be calibrated in accordance with QP-12.3 prior to conducting activities described in this procedure. Hand tools do not require calibration as torque values are recommendations and do not impact the quality of the data.

6.3.3 Environmental Conditions

N/A

6.4 Control of Samples

N/A

6.5 Implementing Procedure

6.5.1 **DCS Engineering Support** or the **Data Manager** obtains or develops the Instrument Index and the Loop Index based on the need of the Principal Investigator (PI).

6.5.2 **DCS Engineering Support** directs DCS Technical Support to conduct wire termination the DCS.

6.5.3 If baseline readings are not required, **DCS Engineering Support** or the **Data Manager** documents the justification and directs DCS Technical Support or DCS Staff to begin wire termination beginning at subsection 6.5.5, omitting step 6.5.5.4.

6.5.4 **DCS Technical Support** or **DCS Staff** perform baseline readings on the applicable system interface by:

6.5.4.1 Matching the instrument with its system interface assigned in the Loop Index 6.5.4.

6.5.4.2 Documenting the signal path between the process calibrator and the instrument including the serial number / identifier for the process calibrator and the instrument.

6.5.4.3 Connecting the process calibrator to the instrument and taking a reading of the source value from the instrument.

6.5.4.4 Documenting the readings from step 6.5.4.3 and any anomalies encountered.

6.5.5 **DCS Technical Support** or **DCS Staff** continue wire termination activities, connecting wires and ensuring connections, by:

6.5.5.1 Terminating the instrument wire to the assigned system interface using appropriate hand tools.

NOTE: For optimal performance, Hewlett Packard terminal block screws should be tightened to approximately 7 inch pounds.

6.5.5.2 Visually and / or physically inspecting the termination to ensure wires are secured to the system interface.

6.5.5.3 Taking and recording a source value reading from the instrument using the system. Also taking readings of parameters (i.e., current, DC resistance, actual voltage, etc.) that reflect on instrument performance.

6.5.5.4 Comparing the source value readings obtained in step 6.5.5.3 with the baseline reading taken in step 6.5.4.3.

6.5.5.5 Determining if the readings are within the acceptance criteria of the accuracy calculations and if source values appear on the assigned channels, documenting a pass / fail, and noting any discrepancies.

6.5.5.6 Dating and initialing the documentation.

6.5.5.7 Submitting the results to DCS Engineering Support for authentication upon completion of wire termination activities

NOTE: Activities completed by other DCS Staff are submitted directly to the Data Manager.

6.5.6 **DCS Engineering Support** authenticates the documentation and submits it to the Data Manager.

6.5.7 **The Data Manager** finalizes wire termination activities by:

6.5.7.1 Evaluating the wire termination documentation against the acceptance criteria.

6.5.7.2 Directing the DCS Engineer or DCS Staff to make necessary correction in accordance with subsections 6.5.1 through 6.5.5.

OR

6.5.7.3 Authenticating the acceptable documentation.

6.5.7 Developing and submitting to the Records Processing Center in accordance with AP-17.1Q, a records package that includes the records identified in section 7.0.

6.6 Data Acquisition and Reduction.

Actual data collection and reduction is beyond the scope of this procedure.

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6.7 Potential Sources of Error and Uncertainty

Drift in the calibration of equipment, or transposing channel criteria or results are the only potential sources of error identified. Regular calibration of the process calibrator and systems along with the manager's evaluation of the results will minimize the probability of these errors impacting results.

7.0 RECORDS

Implementation of this procedure results in the generation of the authenticated wire termination results documentation. These results include documentation of: the Instrument and Loop Indices including their revision numbers; justification if baseline readings are not required; signal paths; system, process calibrator, and instrument serial numbers/identifiers; anomalies, if any; baseline readings; post-termination instrument readings; malfunctions, if any; termination pass/fail determinations; and authentication of results by responsible personnel.

8.0 ACCEPTANCE CRITERIA

Wire terminations are deemed acceptable when the Data Manager evaluates the results documentation against the acceptance criteria used to perform wire termination and determines the terminations to be adequate for their intended purpose.

9.0 TRAINING REQUIREMENTS

Personnel who conduct work in accordance with Section 6.0 of this procedure require training to this DP. Training is accomplished by "read only."

10.0 ATTACHMENTS

N/A